Primex XR 72MHz Synchronized Time Solution

# XR 1 Watt Transmitter - External Antenna

# Install & User Guide

# Legal Notice

## Primex, Inc.

Primex is a leading provider of synchronized time and environmental monitoring solutions. Our solutions automate and maintain facility compliance, increase efficiencies, enhance safety and reduce risk for organizations in the healthcare, education, manufacturing and government vertical markets.

Worldwide Headquarters

965 Wells Street, Lake Geneva, WI 53147

Phone: 1-262-729-4853 | email: info@primexinc.com | www.primexinc.com

# Regulatory Compliance

## Federal Communications Commission (FCC) / Industry Canada (IC)

**License Requirements**

- Operation of the Transmitter requires a FCC/IC operating license, which must be obtained prior to operation.
- FCC licenses must be renewed every 10 years and the IC licenses must be renewed annually.
- As a service, Primex will file the license application if the end-user desires it. An end-user that does not want Primex to file for the original site license will be required to complete a waiver form, file the required application, and receive a valid license from the FCC/IC prior to use. If you have any questions or need any assistance, please contact Primex Technical Support.
- Primex requires a copy of the licenses in order to complete the factory presets.

**Product Compliance**

- This device complies with Part 90 and Part 15 of the FCC rules and RSS-210 of Industry Canada.
- Operation of this device is subject to the following two conditions:

  1. This device may not cause harmful interference.

  2. This device must accept any interference, including interference that may cause undesired operation.

Changes or modifications to any part of the Primex System components not expressly approved by Primex could void the user's FCC/IC authority to operate the equipment.

**Radio Frequency (RF) Exposure**

To comply with FCC OET65 and Industry Canada RF exposure requirements, the antenna is only to be used or installed in locations where the following antenna separation guidelines exist when the Transmitter is in operation. Distance above roofline is for direct line of sight only. Distance Above Roofline: 8.95 ft. (2.72 m).

## Distance above roofline illustration
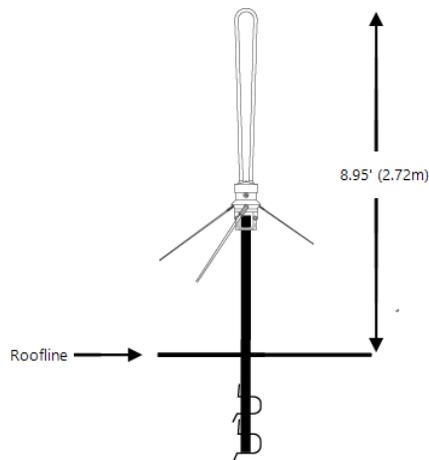
# Important Safety Instructions

READ ALL INSTRUCTIONS BEFORE INSTALLATION, OPERATION, OR MAINTENANCE OF PRODUCT.

Some of the following information may not apply to your particular product model; however, as with any electronic product, precautions should be observed during installation, operation, and maintenance.

- Never operate the Transmitter without the antenna being properly connected to the Transmitter. Operating the Transmitter without an antenna can lead to permanent damage of the Transmitter and poses a safety risk.
- Do not touch any of the antennas while broadcasting.
- Standard acceptance procedures must be followed prior to operating this equipment in the proximity of life support systems.
- Do not operate the Transmitter outdoors, in wet areas were there is standing water, or in areas where there is condensation or the risk of condensation.  Use in any of these environments will damage the Transmitter and void the warranty.
- Do not open the Transmitter to alter the internal elements in any way. This will void the warranty and could lead to unsafe conditions, malfunction, and violations of FCC/IC regulations.
- Do not use a metal ladder during installation of the external antenna.
- During antenna installation, be sure to wear shoes with rubber soles and heals and wear protective clothing with long sleeves and rubber gloves.
- Do not install the antenna on a wet or windy day when lighting or thunder is in the area or near power lines. Power lines, telephone lines, and guy wires look the same. As a precaution please assume any wire can electrocute you.

The installation, maintenance, or removal of an antenna requires qualified, experienced personnel. The installation instructions are written for such installation personnel.

Antenna systems should be inspected once a year by qualified personnel to verify proper installation, maintenance, and condition of equipment.

Primex disclaims any liability or responsibility for the results of improper or unsafe installation practices.

# Contents

# XR Series Specifications

XR Series Transmitters broadcast over a 72MHz frequency that leverage the precision of GPS satellite or Network Time Protocol (NTP) time to wirelessly synchronize time to analog and digital clocks, timers and other time receivers throughout a facility.

# Transmitter Operation

### Time synchronization

Once a Transmitter has received its time, from either a GPS Receiver, NTP time source (XR models only) or another Transmitter, it sets its internal clock. It then transmits time information or schedules via a wireless radio frequency signal to the wireless clocks, bells, and other devices in the system. As a result, the system devices are precisely synchronized to each other and all time, schedules, and events are kept current.

Time Source: a Transmitter receives time from a GPS Receiver or a NTP server (XR models only) and then broadcasts received time and event schedules to clocks and other system devices.

Frequency and channel: a Transmitter operates on channels with 20kHz bandwidths and 72MHz frequency and is preset to one of the channels licensed by the FCC/IC to minimize interference on these frequencies and channels.

Broadcast (Transmit) Schedule Transmitter with External Antenna: broadcasts its synchronized time to the system clocks and devices from the 39th to the 6th minute of the next hour and changes to a standby mode during the 7th to the 38th minute of the hour (standard broadcast schedule). During initial power-up, the Transmitter broadcasts for 8 consecutive hours. After the 8 hour power-up period, the Transmitter reverts to its timed broadcast schedule.

Analog Clock signal search frequency: six pre-scheduled times a day at 10:01, 2:01 and 6:01 a.m. and p.m. lock time (not the actual time of the day), a clock's receiver turns on to search for a Transmitter signal to receive a time update, starting with the previously stored channel number.

Digital Clock/Timer signal search frequency: every 10 minutes on the 5's (5, 15, 25, 35, 45, 55 minutes) of the hour, a clock's receiver turns on to search for a Transmitter signal to receive a time update.

---

### Power-up sequence

1. When the Transmitter is powered on, its front display lights up.

2. Green, yellow, and red LED lights turn on for 2 seconds as a test and then turn off.

3. Green LED illuminates to indicate the Transmitter is broadcasting.

4. Front display initially displays the time as 12:00:00 and its software version.

5. Transmitter checks the position of the switches on the back of the Transmitter, and stores the settings in its memory.

6. Transmitter completes an initialization sequence with its time source. Its time source may be either a GPS Receiver, NTP, or Repeater (Satellite) Transmitter.

## Power failure

During a power failure, the Transmitter continues to track time with the last valid time signal that it received. Once the power had been restored, the Transmitter begins to broadcast (even without a valid time signal) to the down-stream components. Once the Transmitter has been powered on for a few hours, it's capable of keeping track of time off its internal backup power for up to eight hours.

- The system has a fail-safe design. If the failure of a system component or power loss to a component occurs, all down-stream components continue normal operations using their own internal time base.
- If after a specified period of time communication has not been restored, a visual indicator of a loss of communication appears and remains until communication is restored. Loss of communication visual indicators: Transmitter LED flashing, flashing colon on LED digital clocks/timers; stepping of second hand on analog clocks.

> NOTE
>
> Transmitter with an External Antenna: In the event of a facility wide power outage, a Transmitter with an External Antenna will broadcast continuously for 8 hours upon the restoration of power, synchronizing all Primex devices throughout the facility.
>
> In the event power to a Transmitter is shut off and turned back on (power cycled) the Transmitter will broadcast continuously for 8 hours. Power cycling the Transmitter can be used to set/reset system devices. It's not recommended to power-cycle a Transmitter when it is in an error status - indicated when its red LED is flashing.

# XR 1 Watt Transmitter Specifications

| Parameter | Specification |
|---|---|
| Operating Frequency Range | 72MHz |
| Channels | 49 channels available (pre-programmed prior to shipping) |
| Dimensions | 17 in. L x 12 in. W x 1.7 in. D (43.2 cm x 30.5 cm 4.32 cm) |
| Maximum Transmission | 1 Watt (at Transmitter) |
| Radio Technology | Narrowband FM |
| Weight | 9 lbs |
| Settings | Time Zone (Transmitter with External Antenna: time zone is preset by factory)<br>• LAN/Local, 30 min offset, serial/USB/Ethernet connectivity |
| Daylight Saving Time | Bypass switch |
| Display | Liquid Crystal Display (LCD) |
| Power Supply | Input: 120 VAC, 50/60 Hz, 0.6 Amp<br><br>Output: 9 VDC, 2.78 Amp<br><br>6 ft (1.82 m) cord |
| Operating Range | 32° to 122° F (0° to 50° C), non-condensing environment |

NOTE

Canadian Notice - Transmitter with an External Antenna: The manufacturer rated output power of this equipment is for single carrier operation. For situations when multiple carrier signals are present, the rating would have to be reduced by 3.5 dB, especially where the output signal is re-radiated and can cause interference to adjacent band users. This power reduction is to be by means of input power or gain reduction and not by an attenuator at the output of the device.

# Transmitter Back Panel Settings - Channel Number, Time Zone, & Time Source

The setting panel, located on the back side of a XR Transmitter, consists of dial and dip switch settings that set its channel number, time zone, and time source.
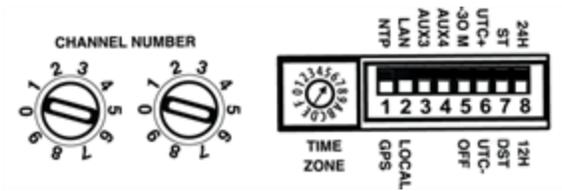


## Channel Number

Preset by factory. The Channel Number is set according to the FCC Site License; do not attempt to change without contacting Primex.

## Time Zone

- Transmitter with External Antenna: the Time Zone is preset by the factory. If your application requires adjustments to these settings, contact Primex Technical Support.
- Transmitter with Internal Antenna: set the Time Zone dial to your system Time Zone using the dial Time Zone switch.

    4 for Atlantic Time Zone

    5 for Eastern Time Zone

    6 for Central Time Zone

    7 for Mountain Time Zone

    8 for Pacific Time Zone

    9 for Alaska Time Zone

    A for Hawaii Time Zone

    0 for Greenwich Mean Time (GMT)

## Time source and time settings

Set the Transmitter dip switch settings below to meet the system requirements.

| Switch | Function | Up Position | Down Position |
|--------|----------|-------------|---------------|
| 1 | NTP/GPS | Receive time from NTP server. | Receive time from a GPS Receiver. |

| Switch | Function | Up Position | Down Position |
|---|---|---|---|
| | Transmitter switch settings must be set for NTP time, which is specific to the transmitter's firmware version. The firmware version is displayed on the transmitter front LCD display in the lower-left corner. For version 1.79, set switch 1 to the UP position and switch 2 to the DOWN position. For versions below 1.79, set switch 1 and 2 to the UP position. | | |
| 2 | LAN/Local | LAN network connection is enabled.<br><br>Required for use of NTP time source. | Local USB and/or serial port attached to unit is enabled. |
| 3 | Aux 3 (setting unassigned) | Not applicable | Not applicable |
| 4 | Aux 4 (setting unassigned) | Not applicable | Not applicable |
| 5 | -30M | -30 minute offset enabled<br><br>Transmitter is installed in Newfoundland or other countries with a -30 minute off set. | -30 minute off set disabled<br><br>(default position) |
| 6 | UTC Offset | Transmitter is installed in Europe. | Transmitter is installed in North America |
| 7 | Daylight Saving Time | Daylight Saving Time is disabled. | Daylight Saving Time is enabled. |
| 8 | 12-Hour or 24-Hour Time | Time is displayed in 24 hour time. | Time is displayed in a 12 hour time. |

# GPS Receiver Specifications

A GPS Receiver draws time information from the U.S. Government Satellites, providing the system with Coordinated Universal Time (UTC).

- Mounted to rooftop, pole, or window (not a Low-E glass window).
- GPS Receiver sends UTC time to the Transmitter via the NMEA 0183 standard protocol.
- Optional GPS extension cable. A specially designed low-resistance cable to extend the distance between GPS Receiver and Transmitter. The maximum total length of the cable cannot exceed 200 ft. (60.96 m).

| Parameter | Specification |
|---|---|
| Cable | 10 ft. (3.05 m) cable<br><br>50, 100 and 200 ft. (15.24 m, 30.48 m and 60.69 m) extensions available. The maximum total length of the cable cannot exceed 200 ft. (60.96 m). |
| Dimensions | 2.5 inches W x .75 inches H (6.35 cm x 1.91 cm) |
| Mounting Bracket | 3.5 inches W x 1.4 inches H x 4.5 inches D (8.89 cm x 3.56 cm x 11.43 cm)<br><br>Included for rooftop or window installation. |
| Weight | 0.75 lb (.34 kg) |
| Operating Range | -32° to 158° F (-30° to 70° C) |

# Ground Plane Omnidirectional Antenna Specifications

The external antenna is a heavy duty, light weight ground plane antenna designed to be mounted outdoors.

- Designed for mounting to a 1.25 inches (3.17 cm) rigged galvanized conduit.
- Best operation is obtained when the ground plane rods are above all objects.

| Parameter | Specification |
| --- | --- |
| Frequency Range | 68–80 MHz |
| Gain | 0 dBd |
| Impedance | 50 ohms |
| VSWR | <1.5:1 |
| Polarization | Vertical |
| Maximum Input Power | 75 watts (at 50° C) |
| H-plane Beamwidth | Omni |
| E-plane Beamwidth | 78 degrees (half-power) |
| Connector | N-female |
| Weight | 4.4 lb (2 kg) |
| Dimensions | Radiating element: 29.4 inches H (74.7 cm) <br><br> Ground radials: 41.5 inches W (105.41 cm) |
| Lighting Protection | Direct Ground |
| Wind Survival Rating* | 120 mph (200 kph) |
| Compliance | FCC Part 90 Accepted <br><br> IC RSS-119 Accepted |

NOTE

* Mechanical design is based on environmental conditions as stipulated in EIA-222-F (June 1996) and/or ETS 300 019-1-4 which include the static mechanical load imposed on an antenna by wind at maximum velocity.

XR 1 Watt Transmitter - External Antenna Install & User Guide

# Install 1 Watt Transmitter - External Antenna

Leveraging the precision of GPS satellite or Network Time Protocol (NTP) time, XR Series Transmitters wirelessly synchronize time for analog and digital clocks, timers and other satellite Transmitters throughout a facility. The Transmitter includes an external roof mounted antenna, which requires installation by a Primex Certified Installer.

Before you begin to install a 1 Watt Transmitter with an External Antenna, review the information below.

- Review the Installation Guidelines and identify the installation location of the Transmitter and system components.
- Inspect system components to verify packaging includes all supplied parts for each system component and verify no damage has occurred during shipping.
- Do not install or attempt to set the system wireless clocks or devices until the Transmitter and its components are installed and configured, the Transmitter is powered, its time source is configured and time has been received, and the Transmitter is fully operational.

**Installation overview**

Listed below is a summary of the order in which the system components are to be installed and configured.

Step 1: Assemble Ground Plane Omnidirectional Antenna

Step 2: Assemble Antenna Mast

Step 5: Mount Antenna Mast

Step 6: Ground Antenna Mast

Step 9: Ground Transmitter

Step 4: Route Antenna LMR 400 Coaxial Cable

Step 7: Install GPS Receiver

Step 8: Complete Final Antenna Mounting Requirements

Step 9: Establish Transmitter Connections.

Step 11: Configure NTP Time
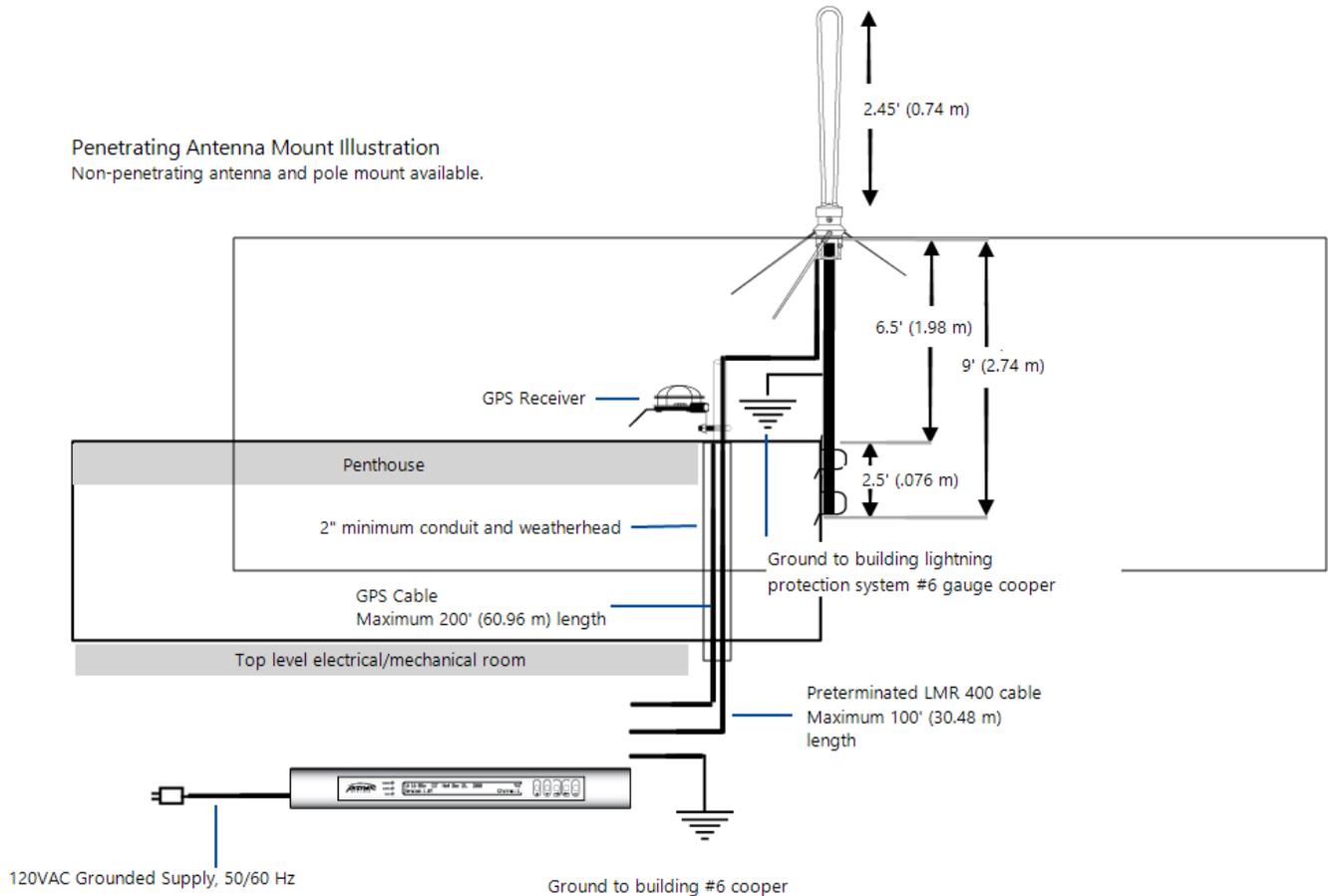
Step 12: Establish Transmitter Settings

Step 13: Verify Transmitter is Operational

# Typical System Setup - 1 Watt Transmitter with External Antenna, GPS Time Source

The illustration below represents a typical installation system setup.

> **NOTE**
>
> Transmitted signal from the antenna radiates in a circular and "umbrella" pattern; therefore a central location for the Transmitter where the antenna is at maximum allowable height is recommended to ensure best possible coverage. In the event that metal objects extend above the level of the ground plane, the radiation pattern will be distorted. Radiation through metal objects will be lower than from other directions.

2.45' (0.74 m)

**Penetrating Antenna Mount Illustration**
Non-penetrating antenna and pole mount available.

6.5' (1.98 m)

9' (2.74 m)

GPS Receiver

Penthouse

2.5' (.076 m)

2" minimum conduit and weatherhead

Ground to building lightning protection system #6 gauge cooper

GPS Cable
Maximum 200' (60.96 m) length

Top level electrical/mechanical room

Preterminated LMR 400 cable
Maximum 100' (30.48 m) length

120VAC Grounded Supply, 50/60 Hz

Ground to building #6 cooper

# Tools and Equipment Required

To following tools and equipment below are required to install a Transmitter with an External Antenna.

- Hammer drill
- Power drill
- 3/4 inch concrete drill bit, 18 in. (45.7 cm) long
- Penetrating mount only: 5/8 inch concrete drill bit, 18 inch (45.7 cm) long
- 1/2 inch wrench
- 3/4 ft. deep well socket with ratchet
- 10 inch (25.4 cm) adjustable wrench
- Phillips screwdriver
- Flat head screwdriver
- Lineman's pliers
- Shears/scissors
- Silicone caulk; required to seal cabling/ground penetration
- Transmitter rack (recommended)
- Building ground near Transmitter
- Ground near transmitting antenna

# Installation Location Requirements

When planning the system installation of a Transmitter with an External Antenna, Primex recommends taking into consideration the below guidelines. Location is extremely important to ensure the best operation of your system.

> NOTE
>
> Prior to installation and to assure optimum performance of the system, it's recommended a site survey is completed by Primex. The site survey includes an analysis and recommendation of the installation location of the system components and ground plan omnidirectional antenna.

- Transmitter should be located on the tallest building near center of area of coverage. In a multi-story building, locate Transmitter on the top floor; significantly improves coverage to the lower floors due to the "umbrella" pattern of transmission.
- Transmitter must be located within 100 feet (30.4 m) from the antenna. The maximum cable length allowed between the External Antenna and Transmitter is 100 feet (30.4 m). The system is attenuated to the 100 feet (30.4 m) of coaxial cable; typically figure between 80 to 85 feet of usable cable length.
- Transmitter must be located a minimum of 4 feet (1.2 m) above the floor.
- Transmitter must be located within 5 feet (1.5 m) from a 120 VAC electrical outlet. 10 AMP dedicated service recommended.
- Transmitter enclosure clearance. 5 or 30 Watt Transmitter enclosure dimension is 18" L x 22" W x 22" D (46 cm L x 56 cm W x 56 cm D), required wall space is 24" L x 30" H x 30" D, allowing for a minimum clearance of 4" (10 cm) rear, 12" (30.4 cm) front, and 10" (25.4 cm) side. 1 Watt Transmitter enclosure dimension 17" L x 12" W x 2" D (5.08 cm L x 43.18 cm W x 30.48 cm D), required area on the wall is 24" L x 18" W x 3" H.
- Transmitter must be located in a controlled environment that is 32 to 122° F (0 to 50° C) and non-condensing humidity environment.
- Transmitter shelf mounting: For 5 and 30 Watt Transmitter models, a shelf with enforcement must be provided that is 24" x 24" and support a weight of 60 lbs. A shelf for a 1 Watt Transmitter can be purchased from Primex.
- External Antenna must be located at a minimum of 15 feet (4.5 m) clear from the radius of other antennas.
- External Antenna must be located at least 10 feet (3 m) from normal traffic area.
- External Antenna mast must be located within 10 feet (3 m) from earth ground.
- External Antenna cannot be placed on or directly adjacent to walls or metal structures.
- External Antenna cannot be located near television receiving antennas.
- External Antenna cannot be mounted indoors or in enclosed areas.
- External Antenna cannot be mounted to pre-existing antenna towers. If this is desired, contact Primex prior to installation.
- 5 or 30 Watt Transmitter in healthcare facility: External Antenna must be located 30 feet (9 m) from any window or other glass openings. If Hospital Paging Link Receiver is located on roof, Primex is required to be supplied the frequency prior to installation.

# GPS Receiver Installation Location Guidelines

Determine a suitable location for the GPS Receiver unit. Location is extremely important to ensure the best operation of the system.

- GPS Receiver must be mounted where it has a "clear view of the sky" to receive a GPS signal 24 hours a day.
- Typical mounting locations of the GPS Receiver unit include the inside of a window (not a Low-E glass window), to an exterior pole, or on a rooftop.
- GPS Receiver unit should be kept away from large metal objects.
- GPS Receiver unit and cable must be mounted above any potential standing water, snow depth, leaves or other obstructions and is protected from the weather.
- Maximum total distance of the GPS cable to the Transmitter cannot exceed 200 feet (60.96 m).
- If the GPS cable is located outdoors, the use of a GelWrap splice enclosure is strongly recommended.

# Step 1: Assemble Ground Plane Omnidirectional Antenna

**How to assemble a Ground Plane Omnidirectional antenna**

1. After removing the antenna from the shipping box, inspect all contents to ensure all parts are on hand and no damaged has occurred during shipping.

2. Screw the three radials into the base of the antenna.

3. Assemble the U-bolt on the base of the antenna. The Mast is to be aligned with the top of the mast channel.
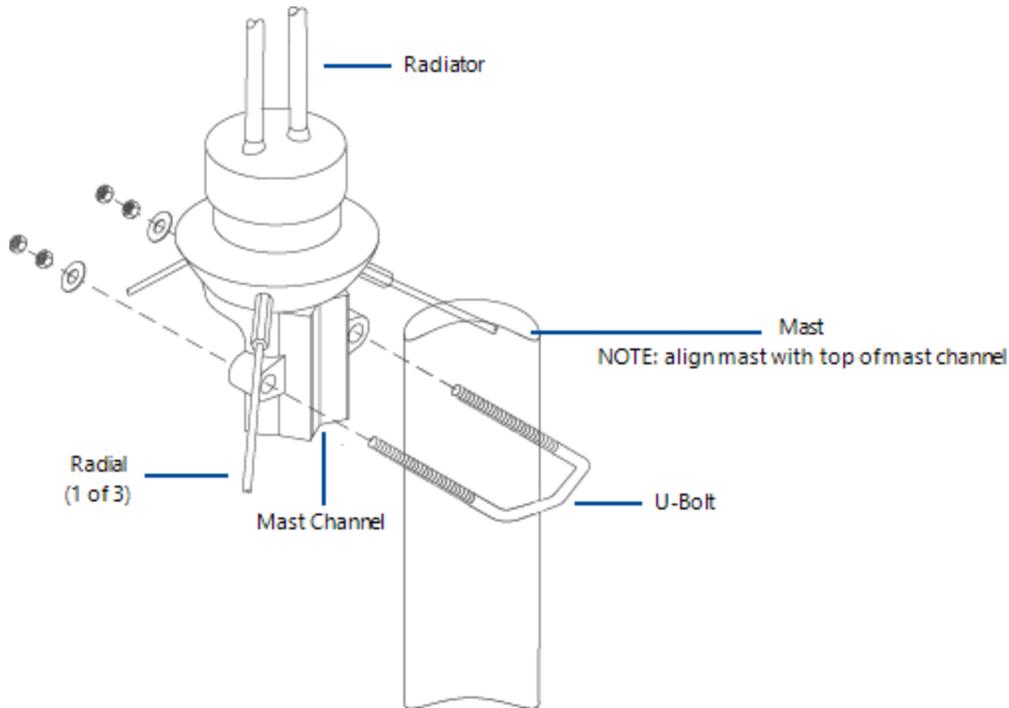
# Step 2: Assemble Antenna Mast

The Antenna Mast has two sections secured by a hex bolt during shipment. The two sections include a 5 ft. x 1.25 inch (1.52 m x 2.54 cm) rigid galvanized conduit and a 5 ft. x 1 inch (1.52 m x 3.17 cm) rigid galvanized conduit.

> NOTE
>
> 1 Watt Transmitter (External Antenna) model only - non-penetrating mounting kit only includes the 5 ft. x 1.25 inch rigid galvanized conduit section.

**How to assemble an antenna mast**

1. Loosen and remove the hex bolt.

2. Remove the 5 ft. x 1 inch (1.52 m x 3.17 cm) rigid galvanized conduit section.

3. Insert the 5 ft. x 1 inch (1.52 m x 3.17 cm) rigid galvanized conduit section into the 5 ft. x 1.25 inch (1.52 m x 2.54 cm) rigid galvanized conduit section in reverse as shipped - to attain a combined antenna mast length of 9 ft. (2.74 m).

4. Align the sections fastening holes and secure sections together using the supplied hex bolt and nuts.

# Step 3: Secure Antenna to Mast

Complete the steps below to secure the antenna to the mast.

1. Attach and fasten the antenna channel side base to the top of the 1 inch rigid galvanized conduit section.

2. Use a 1/2 inch wrench to tighten the nuts on both of the U-bolts, both evenly and securely. To ensure it's secure, tighten the second nut to the first nut.

# Step 4: Route Antenna LMR 400 Coaxial Cable

**How to route the LMR 400 coaxial cable from the Transmitter to the antenna**

1. Drill a 1 inch (2.54 cm) hole through an exterior wall of the building that is in close proximity to the antenna installation location.

2. Roll out the LMR 400 cable to prevent kinks from developing during routing.

3. Route the LMR 400 cable female connector from the Transmitter installation area to the outside installation location of the antenna, leaving enough cable for two 1 ft. (0.30 m) diameter coils at the base of the antenna mast.

4. Form and secure two 1 ft. diameter (305 mm) loops in the LMR 400 cable at the base of the mast for lightning protection.

5. Connect the LMR 400 cable to the antenna.

# Step 5: Mount Antenna Mast

There are three available mounting methods. Installation is dependent upon the mounting kit supplied with the system.

NOTE

Mounting the antenna mast may require two people.

# Assemble Non-Penetrating Roof Mount Kit Mount

The Non-Penetrating Antenna Kit is designed for mounting a ground plane omnidirectional antenna when mounting to the side of a structure is not practical. The overall footprint of the frame is 29 inches x 35 ½ inches (73.66 cm x 88.9 cm).

## Kit Contents

> **NOTE**
>
> Installation requires six 8 inch x 8 inch x 16 inch concrete blocks (not supplied).

The kit is supplied with the following parts. If any of these items are missing, please contact Primex.

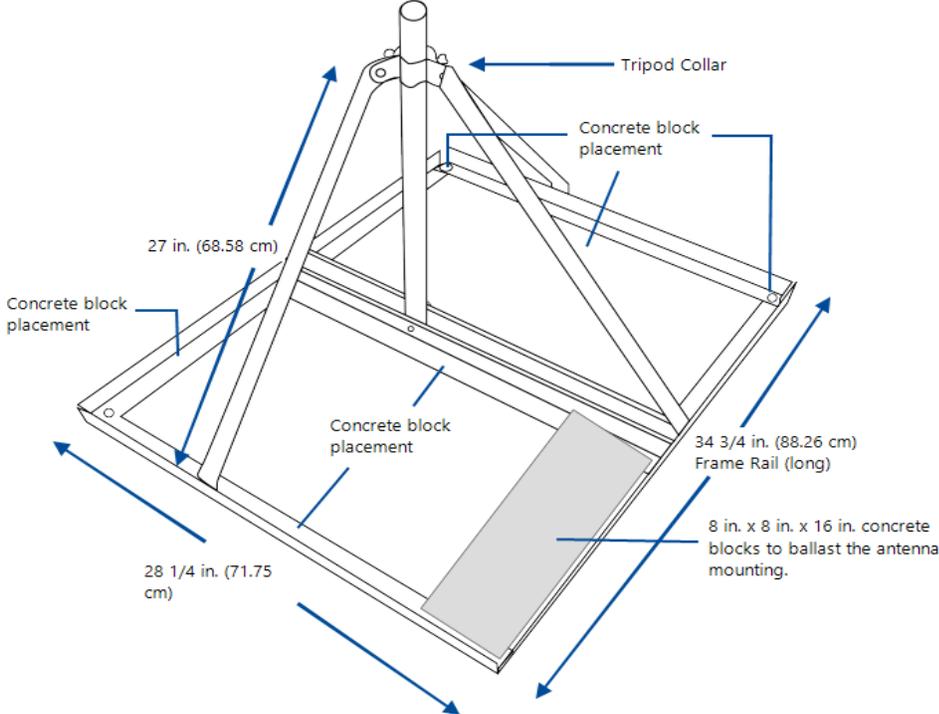| Description | Qty |
| --- | --- |
| Rigid galvanized conduit mast \| 5 ft. x 1.25 inches (1.52 m x 3.17 cm) | 1 |
| Tripod leg \| 27 inches (2.54 cm) each in length | 3 |
| Frame rail (long) \| 34 ¾ inches (88.26 cm) | 2 |
| Frame rail (short) \| 28 ¼ inches (71.75 cm) | 4 |
| Grounding Clamp | 1 |
| Long carriage bolt | 1 |
| Short carriage bolt | 11 |
| Flat washers | 12 |
| Lock nuts | 12 |

### How to assemble a Non-Penetrating Antenna Mount

1. Verify the kit contents.

2. Assemble the outer frame by laying the two long frame rails parallel to each - approximately 30 inches (76.2 cm) apart.

3. Insert a short carriage bolt from the bottom at each frame rail end, pointing skyward (4 total).

4. Connect the two long frames rails by placing the two short frame rails on top of the four protruding bolts to form a rectangle.

   Make sure the square holes in the short tail "sides" are directly opposite each other.

5. Place a washer and nut on each of the four bolts and finger tighten.

6. Position the tripod within the four-sided frame.

7. Secure the three tripod legs to the inside of the frame by inserting three short bolts, from the inside and placing the washer and nut on the outside of the frame.

8. Drop the bottom of the mast (end with hole) through the top of the tripod collar.

9. Place the remaining two short rails parallel to each other, separated by the bottom of the mast.

10. Align the hole at the bottom of the mast, with the two square holes in the short frame rail sides.

11. Insert the long bolt and connect the frame rails to the mast.

12. From the underside of the frame, insert the four remaining short bolts upward and connect the inner short tails to the frame.

13. Tighten all nuts to secure.

14. Use six 8 inch x 8 inch x 16 inch concrete blocks to ballast the antenna mounting. Blocks are to be placed from rail to rail on each side of the mast; three blocks per side with a single block placed on each end and one in the middle.

## Non-Penetrating Mount Illustration

Overall footprint: 29 in. x 35 1/2 in. (73.66 cm x 90.17 cm)

Tripod Collar

Concrete block placement

27 in. (68.58 cm)

Concrete block placement

Concrete block placement

34 3/4 in. (88.26 cm) Frame Rail (long)

28 1/4 in. (71.75 cm)

8 in. x 8 in. x 16 in. concrete blocks to ballast the antenna mounting.

# Install Penetrating Antenna Kit

The Penetrating Antenna Kit contains the materials required to mount the antenna to a wooden pole or masonry wall. A 5/8 inch (1.58 cm) diameter mounting hole is required and the maximum diameter of the pole or wall thickness is 14 inches (35.56 cm).

## Kit contents

The kit is supplied with the following parts. If any of these items are missing, please contact Primex.

| Description | Qty |
| --- | --- |
| Rigid galvanized conduit section | 5 ft. x 1.25 inches | 1 |
| Rigid galvanized conduit insert | 5 ft. x 1 inch | 1 |
| Antenna mounting clamp | 2 |
| Hex head bolt | 1/2 inch | 2 |
| Bolt washer | 1/2 inch | 8 |
| Lock washer | 1/2 inch | 8 |
| Hex nut | 1/2 inch | 8 |

**How to mount an antenna using a Penetrating Antenna Kit**

> NOTE
>
> The recommended diameter of the pole or the wall thickness should not exceed 14 inches (35.56 cm).

1. Verify the kit contents.

2. Assemble both clamps, as shown below, tightening the hex nuts to a torque of approximately 45 ft-lbs.
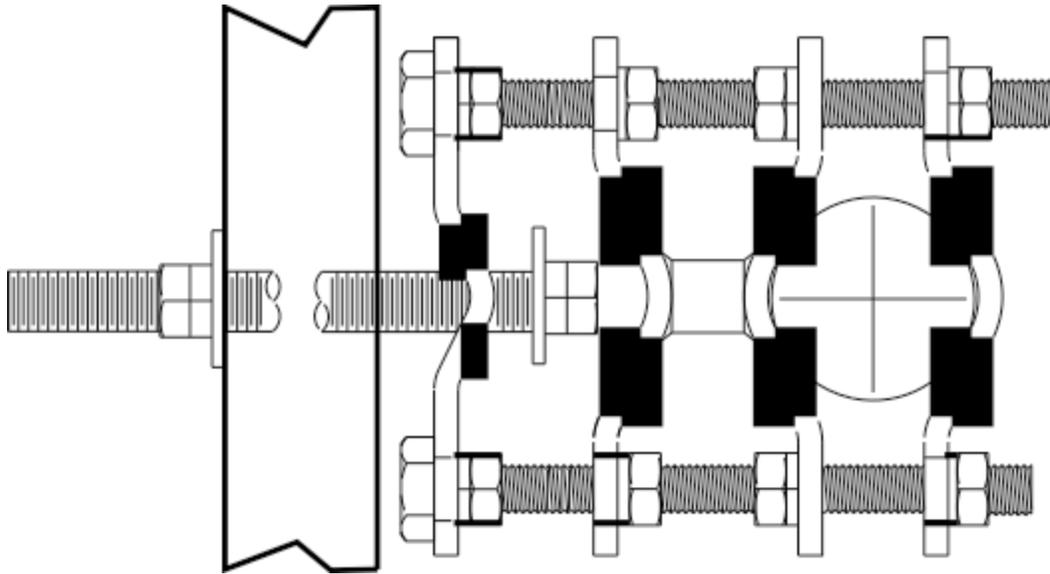
3. Remove the nut and washer from the 14 inch threaded rod.

4. Drill a 5/8 inch hole through the top of an exterior wall.

5. Insert the 14 inch threaded rod through the hole in the wall. If the thickness of the wall is greater than 10 inches, a longer rod may be required. Different lengths of rod are available at hardware stores. If a longer threaded rod is needed, use a 5/8"-11 threads per inch rod.

6. Place the nut and metal plate over the rod.

7. Tighten the square nuts to an approximate torque of approximately 55 ft-lbs.

8. Drill a second 5/8 inch (1.59 cm) hole 2.5 ft. (0.76 m) directly below the first hole.

9. Ensure both clamps are vertically aligned, as shown below
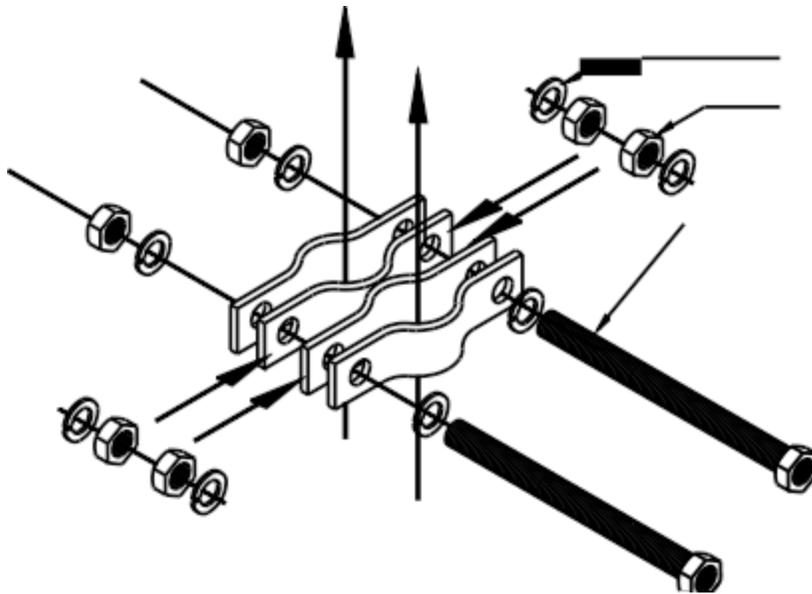
10. Repeat Steps 4 through 6.

11. Connect the LMR 400 cable to the antenna. Be sure the connection is tight.

12. Insert the mast into the clamps.

13. Tighten both clamps evenly and securely.

14. Install gelwrap splice enclosure over the connection between the LMR400 cable and antenna. Secure gelwrap to mast using common electrical tape or cable ties.

15. Next, route the antenna cable. To learn more, view "Step 4: Route Antenna LMR 400 Coaxial Cable" on page 23.

XR 1 Watt Transmitter - External Antenna Install & User Guide

# Install Antenna Pole Mount Kit

The Antenna Pole Mount kit is designed for the purpose of mounting the antenna to round or angled tower legs.

- The clamps can be used on round tower legs that measure from 1.25 inches to 3.25 inches (3.17 cm to 8.25 cm) OD or on angled tower legs that measure up to 3 in. (7.62 cm) on a side.
- The center section of each clamp is welded to provide mechanical stability and all parts are hot-depped galvanized steel.

## Kit contents

The kit is supplied with the following parts. If any of these items are missing, please contact Primex.

| Description | Qty |
|---|---|
| Rigid galvanized conduit section \| 5 ft. by 1.25 inches | 1 |
| Rigid galvanized conduit section \| 5 ft. by 1 inches | 1 |
| X style clamp | 2 |
| U-clamp | 4 |
| 1/2 inch all thread bolt | 4 |
| 1/2 inch lock washer | 16 |
| 1/2 inch hex nut | 16 |

**How to mount an antenna using a Pole Mount Antenna Kit**

1. Verify the kit contents.

2. Assemble both clamps, tightening the hex nuts to an approximate torque of approximately 45 ft-lbs.

3. Tighten half of one clamp two feet below the top of the pole. Use a 3/4 inch wrench to do this and be sure to tighten the clamps both evenly and securely.

4. Using a 3/4 inch wrench, tighten half of the other clamp a few in. below the top of the pole. Be sure to tighten the clamps both evenly and securely.

5. Connect the LMR 400 cable to the antenna. Be sure the connection is tight.

6. Insert the mast into the clamps. The bottom of the mast should be a minimum of 2 inches below the bottom clamp.

7.  Using a 3/4 inch wrench, tighten all nuts on both clamps.

8.  Next, route the antenna cable. To learn more, view "Step 4: Route Antenna LMR 400 Coaxial Cable" on page 23.

## Pole Mount Assembly Illustration



XR 1 Watt Transmitter - External Antenna Install & User Guide
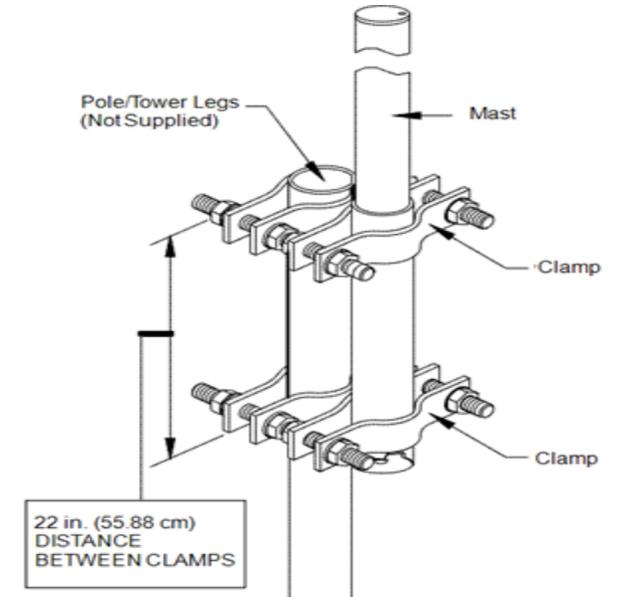
# Step 6: Ground Antenna Mast

> **NOTE**
>
> The National Electrical Code (NEC) requires that every antenna installation be grounded. Also many areas have local antenna grounding codes. Be sure that you are familiar with local grounding and other antenna regulations and codes.

**How to ground the antenna mast**

1. Secure the ground clamp (supplied) around the antenna mast.

2. Insert and tighten the #6 gauge wire (supplied) in the ground clamp.
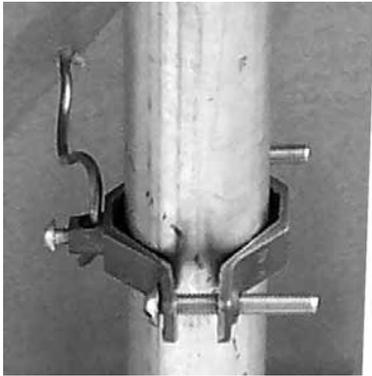


> **NOTE**
>
> Cut the wire off at the necessary length. The remainder of the wire will be used to ground the Transmitter.

3. Connect the other end of the #6 gauge wire to a verified building/earth ground.

# Step 7: Install GPS Receiver

A GPS Receiver is required when a Transmitter is set to use GPS as its time source.

## Installation location guidelines

Determine a suitable location for the GPS Receiver unit. Location is extremely important to ensure the best operation of the system.

- GPS Receiver must be mounted where it has a "clear view of the sky" to receive a GPS signal 24 hours a day.
- Typical mounting locations of the GPS Receiver unit include the inside of a window (not a Low-E glass window), to an exterior pole, or on a rooftop.
- GPS Receiver unit should be kept away from large metal objects.
- GPS Receiver unit and cable must be mounted above any potential standing water, snow depth, leaves or other obstructions and is protected from the weather.
- Maximum total distance of the GPS cable to the Transmitter cannot exceed 200 feet (60.96 m).
- If the GPS cable is located outdoors, the use of a GelWrap splice enclosure is strongly recommended.

## GPS Receiver mounting kit contents

| Part | Quantity |
|------|----------|
| Mounting bracket | 1 |
| GPS 18 LVC and connector | 1 |
| M3 x 0.5 x 6 mm pan head screws | 2 |
| #6 x 3/8 sheet metal screw | 3 |
| Suction cups | 3 |
| U-bolt with nuts for mounting on 1 inch (2.54 cm) pole | 1 |

**How to mount a GPS Receiver**

1. Verify the kit contents and the installation location meets the installation guidelines.

2. From the outside of the building, route the GPS cable.

   External antenna Transmitter: route through a 3/4 inch drilled hole into the building.

3. Assemble and mount the GPS Receiver unit to either the inside of a window (not Low-E glass) or to an outside pole or

   rooftop. The mounting location is required to have a clear view of the sky.
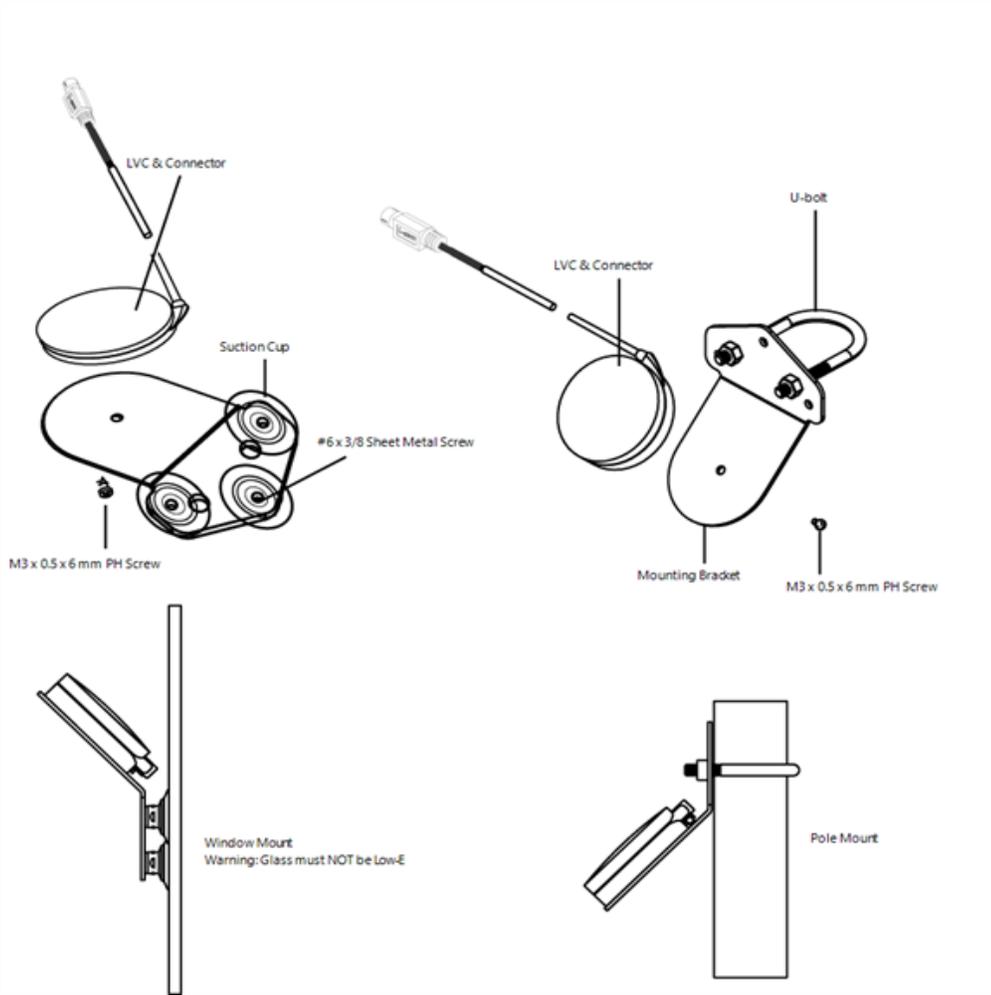
> **NOTE**
>
> Be sure to follow local building code requirements when attaching the GPS unit to the inside of a window. Clean the windowpane before using the suction cups for attachment.

4.  Route GPS cable and connect to Transmitter GPS connection.

    1 Watt Transmitter: connect cable to the GPS IN connection.

    5 or 30 Watt Transmitter: connect cable to the Transmitter exciter GPS IN connection.

## GPS Receiver installation components and illustration

LVC & Connector

Suction Cup

#6 x 3/8 Sheet Metal Screw

M3 x 0.5 x 6 mm PH Screw

LVC & Connector

U-bolt

Mounting Bracket

M3 x 0.5 x 6 mm PH Screw

Window Mount
Warning: Glass must NOT be Low-E

Pole Mount

# Step 8: Complete Final Antenna Mounting Requirements

During this step, you will weatherproof and secure the cabling, verify all connections are secure, and caulk any exterior holes.

1. Weatherproof the antenna connection using GelWrap kit supplied.

2. Secure the GPS cable and LMR 400 cable to the building and mast.

3. Leave a drip loop where both cables enter the building to prevent water from entering the building.

4. Use UV resistant zip ties to secure the cables to the mast and building.

> WARNING
>
> Do not zip tie the GPS cable to the LMR 400 cable. These two cables must be 2 inches (5.08 cm) apart at all times, with the exception of the point where they enter into the building.

5. Verify all nuts and bolts in the mounting hardware are secure.

6. Caulk all exterior holes.

7. Secure and tie wrap all indoor cables.

# Step 9: Ground Transmitter

Complete the steps below to ground the Transmitter.

1. Connect and tighten the terminal ground lug (supplied) on the Transmitter.

2. Insert and tighten #6 gauge wire (supplied) into the Transmitter terminal ground lug.

3. Connect other end of wire to a verified building/earth ground source.

# Step 10: Establish Transmitter Connections

### Connect External Antenna LMR 400 cable to Transmitter

1. Connect the LMR 400 cable to the Transmitter "External Antenna" port, located on the rear of the Transmitter.

### Time source connection

The system can be configured to use GPS or NTP time.

- GPS: plug the supplied GPS cable into the Transmitter "GPS IN" connection.
- NTP time: connect a network cable to the Ethernet port/Network LAN connection and configure the Transmitter to use NTP time. To learn more, view " Configure NTP Time (Optional)" on page 1.

### XR Transmitter connection illustration
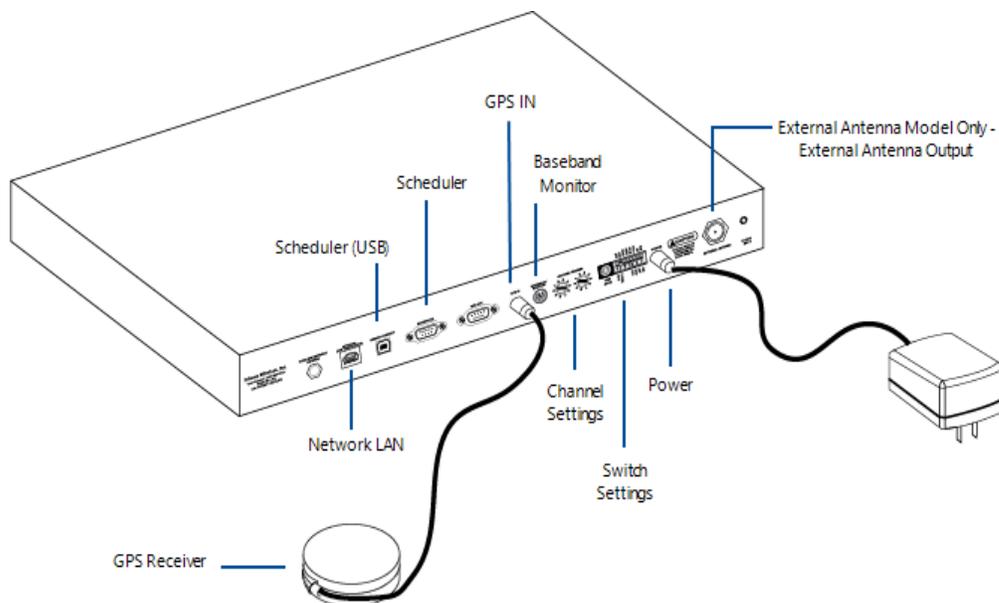
**Transmitter connection specifications**

| Connection | Type | Description |
| --- | --- | --- |
| Network LAN | RJ-45 Ethernet | NTP time source |
| Scheduler USB (Server Connect) | USB Type B | Scheduler connection |
| Scheduler | Serial RS232 DB9, male | Scheduler connection |
| GPS IN | MiniDIN 7-Pin | GPS Receiver connection |
| Baseband Monitor | MiniDIN 9-Pin | Amplifier diagnostic connection |
| Power | 9V DC power | AC-power connection |
| External Antenna | Coaxial | External antenna connection to Transmitter enclosure external antenna connection |

# Step 11: Configure NTP Time

An XR Transmitter can be configured to use NTP as its time source. If the system will use NTP, complete the configuration procedures below.

## Overview

To use a NTP time source:

- Transmitter is required to be connected to a wired Ethernet network.
- Transmitter switch settings must be set for NTP time, which is specific to the transmitter's firmware version. The firmware version is displayed on the transmitter front LCD display in the lower-left corner. For version 1.79, set switch 1 to the UP position and switch 2 to the DOWN position. For versions below 1.79, set switch 1 and 2 to the UP position.
- Optionally can be configured to use an alternate NTP time source if the factory-default NIST time source will not be used.
- Transmitter NTP settings are accessed and configured from a web browser, use of Firefox is strongly recommended, on a computer that is on the same Local Area Network (LAN) as the Transmitter. If you need assistance, contact the on-site IT department.

> NOTE
>
> Prior to configuring the NTP time source, the IP address of the NTP server and Transmitter is required to complete this configuration. Before beginning this procedure set your computer to use a static IP address.

## Transmitter Factory Default Network Settings

- Factory-default IP address: 192.168.1.1
- Subnet mask: 255.255.255.0
- User name and password: blank (not required)
- Pre-Configured NTP Time Source: By default when configured for NTP time, the Transmitter is programmed from the factory to obtain the NTP time from the National Institute of Standards and Technology. According to the NIST they provide a public service by outputting one of two official time sources by the United States. Readings from the clocks of the NIST contribute to world time, called Coordinated Universal Time (UTC). The time maintained by NIST should never differ by more than 0.000 0001 seconds from UTC. For more information, please visit: http://www.nist.gov

> NOTE
>
> Be sure to write down and file all changes made to the network configuration settings. Once the default Transmitter static IP address is changed, the factory default IP address will no longer work and you must use the new IP address to access the Transmitter configuration.

**How to configure a Transmitter to use a NTP time source**

1. Transmitter switch settings must be set for NTP time, which is specific to the transmitter's firmware version. The firmware version is displayed on the transmitter front LCD display in the lower-left corner. For version 1.79, set switch 1 to the UP position and switch 2 to the DOWN position. For versions below 1.79, set switch 1 and 2 to the UP position. Located on the back of the transmitter, set the dip switch settings to the firmware version.

2. Insert one end of an Ethernet cable into the Ethernet port located on the back of the Transmitter and the other end into a port on the facility's Ethernet network.

3. Apply power to the Transmitter.

4. From your computer open a web browser, recommend use of Firefox is strongly recommended, and from the address bar enter the Transmitter factory default IP address: http://192.168.1.1

   If the Transmitter IP address has been changed from the factory default address, complete the steps in topic Set a Temporary IP Address for the Transmitter LAN Interface

   > NOTE
   >
   > Your computer is required to be on the same subnet as the Transmitter (for example: 192.168.1.10).
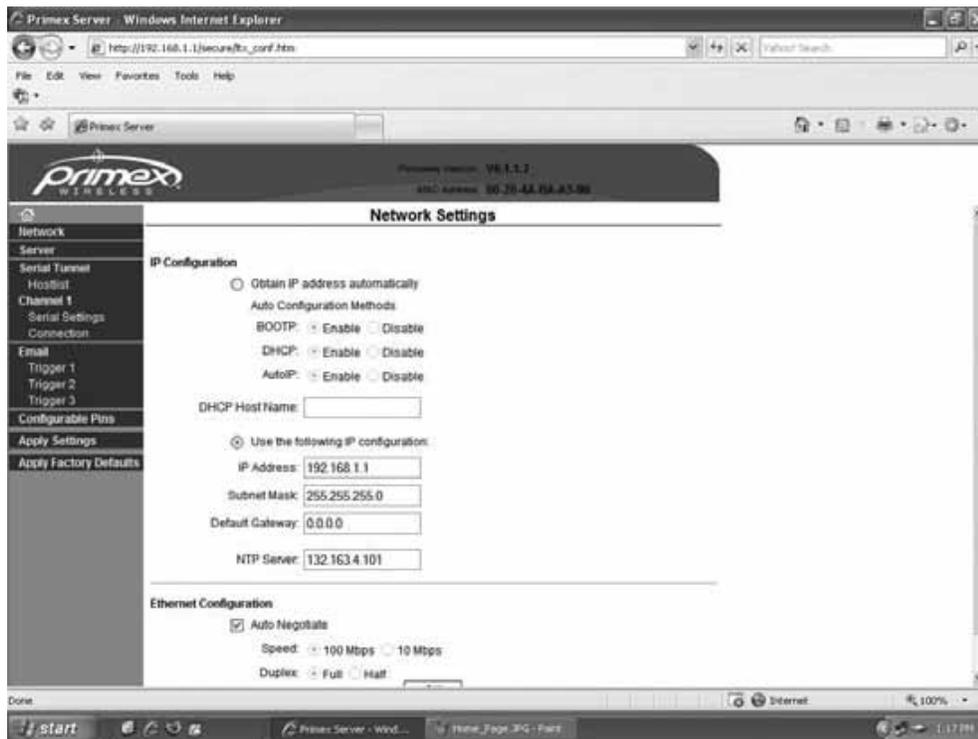
5. The Connect To dialog window is displayed.



6. Leave both user name and password blank, click OK to log into the Transmitter. The XPort Device Configuration Manager screen is displayed.

7. Click **Network**. The Network Settings screen is displayed.



8. To change the factory default static IP address, set the options in the Network Settings screen.

   - To use DHCP, select "Obtain IP address automatically". You must also enter the DHCP Host Name.
   - To use a static IP address, select "Use the following IP configuration" and enter the IP Address, Subnet Mask and Default Gateway.

9.  (Optional) Enter the IP address of the NTP server to set the Transmitter's time source.

10. Click OK.

11. Click Apply Settings on the configuration frame.

    The Transmitter automatically reboots (restarts). The window below is displayed.
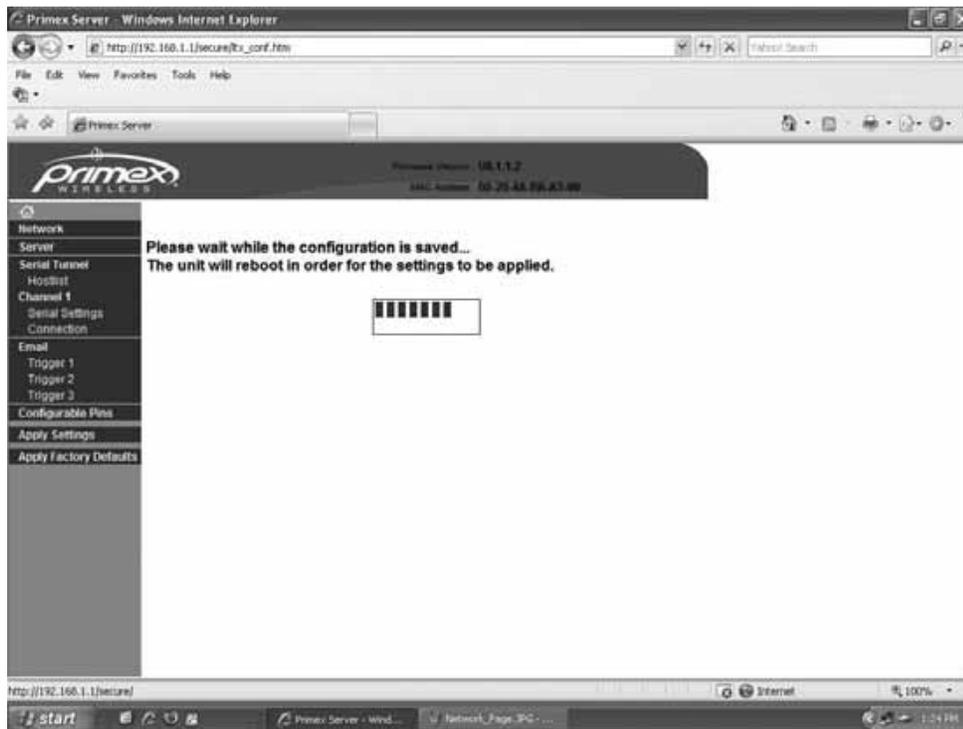
# Set a Temporary IP Address for the Transmitter LAN Interface

When configuring a Transmitter for NTP time and the IP address of the Transmitter is not known, you can assign a temporary IP address. Using the temporary IP address you can then access the Transmitter's network settings configuration screen to set the NTP time source. You may need to perform this procedure if you have forgotten the Transmitter's IP address or if the Transmitter is set to use DHCP.

> NOTE
>
> The assigned temporary IP address used during this procedure is only accessible as long as the Transmitter is powered. If power is lost before the IP address is configured, you will need to repeat this procedure.

**How to set a temporary Transmitter IP address**

1. On your laptop disable its wireless network connection. This ensures the laptop does not compete with any wireless networks in range when obtaining or assigning the temporary IP address.

2. Change the IP address of your laptop to a static IP address that is on the same subnet as the Transmitter. For example, if the Transmitter IP address will be 192.168.0.6, you can set the laptop's IP address to 192.168.0.2 with a subnet of 255.255.255.0.

3. Connect an Ethernet cable directly from your laptop's Ethernet port to the Transmitter's LAN port.

4. From your laptop, open a command window to set the temporary IP address for the Transmitter. To open the command window, select **Start** > **Run**. > from the run dialog, type **cmd** > click **OK**.

5. From the command window, enter the command below to assign a temporary IP address to the Transmitter.

   arp –s xxx.xxx.xxx.xxx xx-xx-xx-xx-xx-xx

   replacing xxx.xxx.xxx.xxx with the temporary IP address of the Transmitter and xx-xx-xx-xx-xx-xx with the MAC address of the Transmitter's LAN port.

   For example, if you want to assign the temporary IP address 192.168.0.6 to a Transmitter with LAN port MAC address  00-20-4A-93-7F-D4, you would enter the command below:

   arp –s 192.168.0.6 00-20-4A-93-7F-D4

   > NOTE
   >
   > If you do not know the MAC address of the Transmitter's LAN port, the MAC address is listed in the Transmitter's Diagnostics menu.

6. To complete assignment of the temporary IP address to the Transmitter, enter the below command into the command window:

telnet xxx.xxx.xxx.xxx 1

replacing xxx.xxx.xxx.xxx with the temporary IP address of the Transmitter.

In our example, you will type:

telnet 192.168.0.6 1

The telnet command will fail, ensuring the web connection will be available.

7. To verify the web connection is available, ping the Transmitter by entering the below command into the command window:

ping xxx.xxx.xxx.xxx

replacing xxx.xxx.xxx.xxx with the temporary IP address of the Transmitter.

If replies are received, you will be able to access the Transmitter through the web interface.

# Step 12: Establish Transmitter Settings

The setting panel is located on the back of an XR Series Transmitter. The setting panel consists of dial and dip switch settings that set its channel number, time zone, and time source.
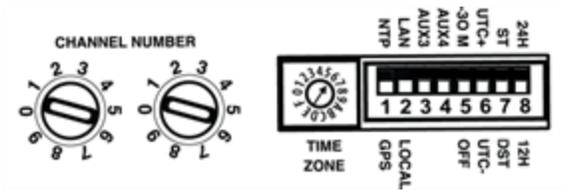


## Channel Number

Preset by factory. The Channel Number is set according to the FCC/ICC Site License; do not attempt to change without contacting Primex.

## Time Zone

- Transmitter with External Antenna: the Time Zone is preset by the factory. If your application requires adjustments to these settings, contact Primex Technical Support.

  4 for Atlantic Time Zone

  5 for Eastern Time Zone

  6 for Central Time Zone

  7 for Mountain Time Zone

  8 for Pacific Time Zone

  9 for Alaska Time Zone

  A for Hawaii Time Zone

  0 for Greenwich Mean Time (GMT)

## Time source and time settings

Set the Transmitter dip switch settings below to meet the system requirements.

| Switch | Function | Up Position | Down Position |
|--------|----------|-------------|---------------|
| 1 | NTP/GPS | Receive time from NTP server. | Receive time from a GPS Receiver. |

| Switch | Function | Up Position | Down Position |
|--------|----------|-------------|---------------|
| | Transmitter switch settings must be set for NTP time, which is specific to the transmitter's firmware version. The firmware version is displayed on the transmitter front LCD display in the lower-left corner. For version 1.79, set switch 1 to the UP position and switch 2 to the DOWN position. For versions below 1.79, set switch 1 and 2 to the UP position. | | |
| 2 | LAN/Local | LAN network connection is enabled.<br><br>Required for use of NTP time source. | Local USB and/or serial port attached to unit is enabled. |
| 3 | Aux 3 (setting unassigned) | Not applicable | Not applicable |
| 4 | Aux 4 (setting unassigned) | Not applicable | Not applicable |
| 5 | -30M | -30 minute offset enabled<br><br>Transmitter is installed in Newfoundland or other countries with a -30 minute off set. | -30 minute off set disabled<br><br>(default position) |
| 6 | UTC Offset | Transmitter is installed in Europe. | Transmitter is installed in North America |
| 7 | Daylight Saving Time | Daylight Saving Time is disabled. | Daylight Saving Time is enabled. |
| 8 | 12-Hour or 24-Hour Time | Time is displayed in 24 hour time. | Time is displayed in a 12 hour time. |

# Step 13: Verify Transmitter is Operational

The final step is to verify the system Transmitter is operating and functional.

1. Verify a GPS signal or NTP time has been received.

2. Verify the time and date displayed on the Transmitter front display are correct.

3. Verify the Channel Number is set correctly.

4. Verify the Transmitter does not have any error codes. To learn more, view "View Diagnostics Menu" on page 51.

# Transmitter Front Display

The front LCD display of a XR Series Transmitter displays its current status, configured settings, and allows you to perform diagnostic tasks. The Transmitter's settings are configured from the setting panel located on the back of the unit.
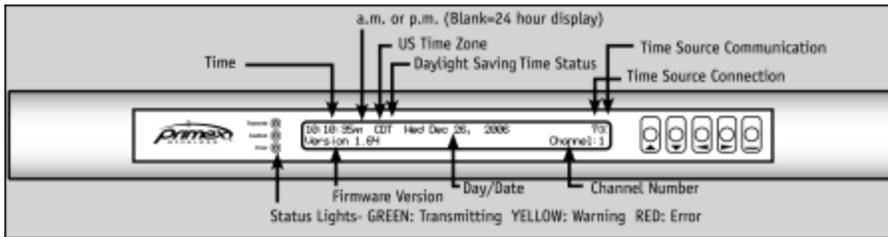
# Transmitter Main Menu

The front display Main Menu provides access to view the Transmitter's settings and diagnostic information.

The Main Menu is reached by pressing once on the ⬜ (right arrow) button.
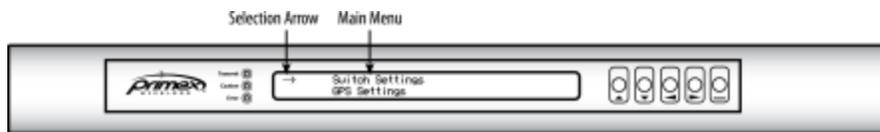


To scroll down the Main Menu use the ⬜ button. If you scroll too far use the ⬜ (arrow up) button to go back.

---

# Main Menu options

Switch Settings: displays what the switch settings, located on the back of the unit, are set to. For detailed information, see topic View Switch Settings

GPS Setup: display is used to select the appropriate GPS Receiver. For detailed information, see topic View GPS Setup Menu

Diagnostics: displays the Transmitter's configuration information. For detailed information, see topic View Diagnostics Menu

Diagnostic Error Code: displays which error, if any, has occurred. For detailed information, see topic Diagnostic Error Codes Specifications

Tech Support Info: displays support contact information.

---

# View Switch Settings

The Main Menu Switch Settings selection provides the details of what the Transmitter dip switch settings, located on the back of the unit, are set to.

**How to access the Switch Settings menu**

Move the selection arrow so that it is pointing to Switch Settings then press the ⬜ (right arrow) button once.



---

**Switch Settings information displayed**

Channel Number: displays the Channel Number the Transmitter is broadcasting from per its FCC/ICC license.

Time Zone: displays the Time Zone.

ST/DST: displays whether or not Daylight Saving Time has been enabled.

24h/12h: displays the time option selected for the display.

UTC offset: displays the Time Zone location relative to Greenwich, England. (- ) is west of England; (+) is East of England.

-30m/off: displays whether or not the -30m is enabled or disabled.

NTP/GPS: displays the time source input option selected (NTP or GPS).

LAN/Local: display whether the Transmitter's serial port is connected to a network port or locally.

Aux 3: future expansions.

Aux 4: future expansions.

## View GPS Setup Menu

Move the selection arrow so that it is pointing to GPS Setup, then press the [right arrow icon] (right arrow) button once. This shows that the Transmitter has a port for a GPS 16 or 18.



## View Diagnostics Menu

To view the Diagnostic Menu move the selection arrow so that it is pointing to Diagnostic, then press the [right arrow icon] (right arrow) button once.
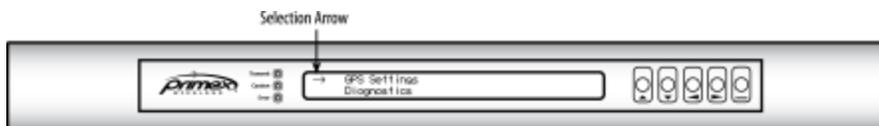


**Diagnostic menu specifications**

There are seven entries that reflect the Transmitter configuration.

Firmware Rev: displays current version of software the Transmitter is running on.

Time Since Last GPS: displays how much time has passed since the Transmitter last received valid time from the GPS Receiver.

Hardware Rev: displays the hardware revision number

GPS/Repeater: displays if there is a GPS or a Repeater connected. If NTP is the time source, Repeater is displayed.

Last Repeater Update: displays how much time has passed since the Transmitter last received valid time from a Repeater Switch or NTP time.

Serial Number: displays the Transmitter serial number.

MAC Address: displays the device ID for the Network Interface.

## Identify Active Diagnostic Error Code

To identify the error code resulting in the red or yellow LED indicator, scroll to the entry that has a dot in front of it; which indicates that entry is the error.

When a Transmitter error code occurs, the yellow or red LED flashes and the error is logged. The LEDs continue to flash until all logged errors have been cleared.



**Diagnostic Error Codes definitions**

Bad Output Power: indicates the Transmitter is not transmitting at the appropriate power level.

PLL Diagnostics: indicates the Transmitter is having trouble locking onto a channel; rendering it unable to broadcast time or schedules.

No GPS or Repeater Connected: indicates the Transmitter is not connected to a time source.

VSWR Errors: indicates there is a problem with either the High Power Antenna (may need repositioning) or the antenna cabling.

No GPS in 48 Hours: indicates the Transmitter has not synchronized to a time source for more than 48 hours.

No 1PPS in 48 Hours: indicates the time on the display has not been synchronized by 1PPS (1 Pulse Per Second) for more than 48 hours.

## Diagnostic Error Codes Specifications

There are six Diagnostic Error Codes that identify the cause of the error occurring.

**How to view Diagnostic Error Code(s)**

1. Move the selection arrow so that it's pointing to the Diagnostic Error Codes, then press the [button icon] button once.



**Diagnostic Error Codes definitions**

Bad Output Power: indicates the Transmitter is not transmitting at the appropriate power level.

PLL Diagnostics: indicates the Transmitter is having trouble locking onto a channel; rendering it unable to broadcast time or schedules.

No GPS or Repeater Connected: indicates the Transmitter is not connected to a time source.

VSWR Errors: indicates there is a problem with either the High Power Antenna (may need repositioning) or the antenna cabling.

No GPS in 48 Hours: indicates the Transmitter has not synchronized to a time source for more than 48 hours.

No 1PPS in 48 Hours: indicates the time on the display has not been synchronized by 1PPS (1 Pulse Per Second) for more than 48 hours.

# Clear Error Codes

Clearing a XR Transmitter error code stops the yellow and red LEDs from flashing.

**How to clear error codes**

1. From the front panel, press right arrow [button icon] button once to access the Main Menu.

2. Use the down arrow button to select Diagnostic Error Codes, then press the right arrow [button icon] button once.

3. Use the down arrow button to scroll to the error, which is indicated by a preceding dot next to the error.

4. Press the right arrow [button icon] button once. The display will show when the error was logged. Note the time and data of the error.

5. Press the right arrow [button icon] button once.

6. Display will read: "Clear all errors?. Press the right arrow  button once.

7. "Yes" and "No" are displayed with a selection arrow.

   Selecting "Yes" followed by the pressing the ENTER button clears the errors.

   Selecting "No" followed by pressing the ENTER button cancels the process and takes you back to the main menu.



Selection Arrow

8. Wait several seconds for the time/date to be displayed.

> **NOTE**
>
> If the LEDs continue to flash, repeat procedure as there may be additional errors to be cleared. If same errors continue to be logged, additional troubleshooting may be required. For further assistance, contact Primex Technical Support at 1-262-729-4860.

XR 1 Watt Transmitter - External Antenna Install & User Guide

# Support

To obtain additional technical documentation for Primex products, visit the Support area on our website at www.primexinc.com

You may require Technical Support when you have questions about product features, system configuration, or troubleshooting. Support services are delivered in accordance with your organization's support agreement, end user licenses agreements, and warranties, either with a Primex Certified Sales and Service Partner or directly with Primex.

## Support through Primex Certified Sales and Service Partners

Ensuring our customers experience excellent service is of utmost importance to Primex. Our network of Certified Sales and Service Partners offer technical support services for Primex products.

If you have purchased Primex products or have a service agreement with a Primex Partner, they are your primary contact for all Technical Support inquires.

## When contacting Primex Technical Support

Make sure you have satisfied the system requirements listed in your product documentation. Also, you should be at the computer or device on which the problem occurred, in case it's necessary to replicate the problem.

When you contact Primex Technical Support, please have the following information available:

- Customer ID/Account Name
- Problem description/error messages
- Device hardware information
- Troubleshooting performed before contacting Primex

## Primex Technical Support

Hours: 8:00 a.m. to 5:00 p.m CST | Monday through Friday

Phone: 1-262-729-4860

Email: techservices@primexinc.com | Web: www.primexinc.com/support

# Five Year Limited Warranty

Primex, Inc. warrants this product to be free from defects in materials and workmanship for a standard of five (5) years from the date of purchase* from an authorized reseller or directly from Primex. Primex, Inc. will at its sole option, repair or replace any components that fail in normal use. Such repairs or replacements will be made at no charge to the customer for replacement parts. The customer will be responsible for any transportation costs. This warranty does not cover failures due to misuse, abuse, accidental or unauthorized alterations or repairs.

The warranties and remedies contained herein are exclusive and in lieu of all other warranties express or implied or statutory, including any liability arising under any warranty or merchantability or fitness for a particular purpose, implied, statutory or otherwise. In no event shall Primex, Inc. be liable for any incidental, special, indirect or consequential damages, whether resulting from the use, misuse or inability to use this product or from defects in the product. Some states do not allow this exclusion or limitation of incidental or consequential damages so the above limitations or exclusion may not apply to you.

To obtain warranty service: If after following the instructions in the product guide, you are certain the product is defective, contact Primex Technical Support to assist with troubleshooting the issue. If the issue cannot successfully be resolved and the product is under warranty, a RMA (Return Material Authorization) will be generated. The RMA form will be provided via email with detailed instructions for the return. All merchandise returned must be shipped to Primex, Inc. Attn: Returns Dept., N3211 County Road H, Lake Geneva, WI 53147.

Primex, Inc. retains the exclusive right to repair or replace the unit at its sole discretion. Such shall be your sole exclusive remedy for any breach of warranty.

* applies to products sold on or after June 1, 2018.